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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention relates to the thread for forged prevention further used for the manufacture approach of this sheet-like object for forged prevention, and this about the paper possessing a very advanced forged prevention means, or the sheet-like object for forged prevention like a plastic sheet.

[0002]

[Description of the Prior Art] In order to make this invention easy to understand, the following explanation mainly mentions and explains the forged prevention form which is the typical example of the sheet-like object for forged prevention.

[0003] Various kinds of forged preventive measures are given so that a bill, a gift certificate, etc. cannot be altered unjustly and cannot be forged. One of the views of forged preventive measures is manufacturing a form using an advanced manufacturing technology so that it cannot manufacture easily. it is ***** in paper about the thread which carried out the slit of a plastic film, the tissue paper, etc. to narrow-width [of about several mm], using a micro slitting machine as the example -- there is a forged prevention form called "the paper containing a thread", and it is mostly used with the bill of each country etc.

[0004] It roughly divides into "the paper containing a thread", and there are two kinds. One is the thing of the class which the thread 1 is buried in paper and does not expose to a form front face as shown in drawing 6 , and as another was shown in drawing 7 , a part of thread 1 is "the paper containing an aperture aperture thread" exposed to the form front face. It is the description that the latter formed in the flow direction of a form the aperture aperture section 2 which made thickness thin intermittently, and the thread 1 is exposed in this aperture aperture section 2.

[0005] moreover, ** -- in order to heighten further the forged prevention effectiveness of the paper [like] containing a thread, forming the micro alphabetic character which gives a water mark 3 or becomes the (patent No. 2845197 official report) and thread 1 front face from a metal vacuum evaporation layer, and a micro image in the aperture aperture section 2 of the paper containing an aperture aperture thread is also performed.

[0006] On the other hand, this invention person etc. was Japanese Patent Application No. No. 358674 [ten to], is the object which performs forged prevention of the medium of the shape of paper or a film, and proposed inserting a detailed semiconductor chip into paper or a film-like medium. ** -- one-side the semiconductor chip 0.5mm or less which contained two or more bits memory, and was equipped with antenna wiring as a semiconductor chip [like], for example can be used, and informational writing and reading of the information by non-contact can be performed.

[0007] In above-mentioned Japanese Patent Application No. No. 358674 [ten to], the approach of inserting a semiconductor chip in the interior of Japanese paper or a front face with Japanese paper fiber in the **** case etc. is proposed in the approach of making two or more semiconductor chips distributing in a medium as an approach of inserting a semiconductor chip into a film-like medium, the approach of inserting a semiconductor chip in the predetermined location between the film-like media of two sheets, and Japanese paper.

[0008]

[Problem(s) to be Solved by the Invention] The conventional "paper containing a thread" mentioned above is preferably adopted as a forged prevention means, in order to require the technique in which the technique of giving a water mark to a ***** technique, the technique of exposing a thread in the aperture aperture section intermittently, and the aperture aperture section for a thread, the technique which forms a micro alphabetic character and a micro image in a thread are advanced.

[0009] However, although the thing which were further mentioned above as a counterfeit difficult forged prevention means and for which it solves and a detailed semiconductor chip is inserted into paper or a film-like medium is proposed since it is not what can be referred to as thoroughgoing, also although it is called these forged prevention means The activity which inserts as detailed a semiconductor chip as this into paper or a film-like medium is actually difficult, and especially the thing for which a semiconductor chip is inserted in the predetermined location in a medium serves as a very difficult activity.

[0010] then, this invention is ***** about a thread — in order to heighten further the forged prevention effectiveness in the conventional forged prevention form, offering the technique which inserts a detailed semiconductor chip in the sheet-like object like paper or a plastic sheet, and a still more detailed semiconductor chip can also be inserted into a sheet-like object easily and efficiently, and it makes as a technical problem offering the technique which can insert a semiconductor chip in the predetermined location in a sheet-like object certainly especially.

[0011]

[Means for Solving the Problem] If this invention person etc. pastes up the detailed semiconductor chip like **** on the thread inserted into the form as a forged prevention means of the forged prevention form like “the paper containing a thread” beforehand from the former and this thread is inserted into paper or the sheet-like object like a plastic sheet, he can insert a semiconductor chip into a sheet-like object easily and efficiently, and will complete a header and this invention for the ability also of the forged prevention effectiveness to improve further moreover.

[0012] That is, this invention is a thread for forged prevention characterized by having pasted one side of the film which carried out the slit of the one-side semiconductor chip 0.5mm or less which contained two or more bits memory, and was equipped with antenna wiring to narrow-width.

[0013] Moreover, the sheet-like object for forged prevention of this invention is characterized by pasting the aforementioned thread together on the front face of a sheet-like object, or having inserted in the interior of a sheet-like object.

[0014] It becomes possible by having pasted up the semiconductor chip beforehand, pasting a thread [like] together on the front face of a sheet-like object, or inserting in the interior of a sheet-like object to raise workability substantially compared with pasting a semiconductor chip together separately to a sheet-like object, or inserting it in it.

[0015] Furthermore this invention is the approach of pasting the aforementioned thread together on the front face of paper or a plastic sheet, and manufacturing the sheet-like object for forged prevention, and it is the manufacture approach of the sheet-like object for forged prevention characterized by to paste a thread together so that said semiconductor chip may be located in a predetermined location by adjusting the tension of the thread at the time of pasting, detecting the location of the timing mark formed in paper or a plastic sheet, and the timing mark given to the thread.

[0016] Furthermore, this invention is the approach of manufacturing the multilayer sheet-like object for forged prevention which consists of pasting two or more sheets of papers, or plastic sheets together, inserting the aforementioned thread between two or more sheets of papers, or plastic sheets. By adjusting the tension of the thread at the time of insertion, detecting the location of the timing mark formed in paper or a plastic sheet, and the timing mark given to the thread It is the manufacture approach of the sheet-like object for forged prevention characterized by inserting a thread so that said semiconductor chip may be located in a predetermined location.

[0017] It becomes possible by pasting together or inserting a thread in a sheet-like object accuracy and to paste together or insert efficiently about a semiconductor chip in the predetermined location of a sheet-like object, detecting these timing marks by making into a rule of thumb the location of the timing mark given to the timing mark and sheet-like object which were given to the thread, as mentioned above.

[0018] The sheet-like object for forged prevention of this invention for example, by applying this to external instruments, such as a reader writer Can deliver and receive information by the non-contact method by wireless, such as an electric wave, and an electrostatic coupling, an electromagnetic wave, between the antennas of a semiconductor chip and external instruments which have been pasted up on the thread, and stored information is read to a semiconductor chip. When this detects whether it is predetermined information, it can recognize certainly whether a sheet-like object is forged.

[0019]

[Embodiment of the Invention] The semiconductor chip used by this invention is a detailed and thin one-side IC semiconductor chip 0.5mm or less which contained two or more bits memory, and was equipped with antenna

wiring, and can read stored information through antenna wiring in a semiconductor chip with a dc-battery less non-contact recognition method.

[0020] ** — a semiconductor chip [like] is manufactured by the following approaches. First, a silicon single crystal wafer with high purity is prepared in a mirror plane. Through the process insulated by insulator layers, such as various oxide films and a nitride, according to a photoresist process, it lets the glass mask with which various kinds of component patterns by which the circuit design was carried out were formed pass on this wafer front face, and a resist pattern is formed in it. It lets this resist pattern pass, and the aforementioned insulator layer is etched, or in plastic ***** of the impurity is carried out, an electric device layer is formed, and the diffusion layer which serves as various transistors, diode, resistance, and a capacitive element eventually is formed. Furthermore, a circuit pattern layer is formed on it and it considers as the gestalt which ends the connection between components of said diffusion layer, and demonstrates circuitry. This wafer is completed as a semiconductor chip, when one side separates into a semiconductor chip with a size of 0.5mm or less for example, using a diamond blade.

[0021] Furthermore, the resonance circuit by the coil component and the capacitor element is formed in this semiconductor chip using a circuit pattern layer, and the antenna which acquires ** microwave energy and a signal on chip is formed. Since this antenna is microwave, and the time constant is small, it is possible by making the inductance of a coil into 2 nanohenries and making a capacitor into 2 picofarad etc. to realize a resonance circuit by the small components circuit. This enables one side to arrange an antenna on a semiconductor chip with a flat-surface dimension of 0.5mm or less. It connects with juxtaposition or a serial and the coil component and capacitor element which form an antenna are connected to the RF receiving circuit realized in a semiconductor chip. Thus, an example of the obtained semiconductor chip 10 is shown in drawing 1 .

[0022] Writing of the information on this semiconductor chip and reading are performed as follows. Two or more bits memory is arranged in the part of the "ID number" of a semiconductor chip which was illustrated to drawing 1 . In order to write information in this memory, the approach of giving energy and a signal from the exterior through the antenna of the completed semiconductor chip, and writing in information, the approach of forming a pattern and writing in information with an electron ray direct writing technique or a laser technique, in the above mentioned wafer condition, etc. are employable. Next, in order to read the information written in in memory, according to non-contact, energy is given to the antenna of a semiconductor chip by the electromagnetic wave, a further specific signal pattern is given, and the approach of reading memory data as the procedure for which it opted beforehand serially can be adopted. These functions are realizable with the analog and digital circuit in a semiconductor chip. Thus, the read information can judge truth or falsehood promptly by collating with memory information [Shinsei / in the database which exists in a root server] through the Internet.

[0023] The dimension of a semiconductor chip sets one side to 0.5mm or less. When a semiconductor chip becomes easy to be omitted from a thread in case the thread which pasted up the semiconductor chip when the semiconductor chip became large from thread width of face, while being manufactured comparatively easily [the duplicate object of a chip] and having come to get, when one side was larger than 0.5mm is pasted together or inserted in a sheet-like object, and a sheet-like object is bent further, a semiconductor chip breaks through a sheet-like object, and it becomes easy to expose outside. Moreover, thickness of a semiconductor chip is preferably set to 0.1–200 micrometers. Manufacturing a semiconductor chip thinner than 0.1 micrometers cannot use difficultly technically. Moreover, if it becomes thicker than 200 micrometers, when it pasted together or inserts in a sheet-like object, the part of a semiconductor chip will become thick too much.

[0024] The thread used in this invention is explained. As a film used as the base, various films, such as cellophane, a polypropylene film, polyester film, a nylon film, a polyvinyl alcohol film, a polyvinyl chloride film, and a polycarbonate film, can be used. Although melting or the construction material which is not softened is used for this base film in the desiccation zone of a paper machine, what has the property which is not usually tintured with adhesiveness at the temperature of a 90–110-degree C desiccation zone is desirable, and the film which has thermal resistance like polyester film from this reason can use it preferably.

[0025] Moreover, if water soluble films, such as polyvinyl alcohol, are used as a thread, it will become possible to dissolve a thread during paper milling depending on the melting temperature of a water soluble film. That is, when the thread which consists of a water soluble film on which the semiconductor chip was pasted up is inserted into paper, a water soluble film will dissolve during paper milling, and only a semiconductor chip will be mounted in paper. Moreover, a semiconductor chip fixes the dissolved water soluble film still more firmly in paper with the adhesive property of the dissolved water soluble film in order to remain to the perimeter of a semiconductor chip. Furthermore, in case it is collected and reused by using a water soluble film as a base film of a thread,

using the forged prevention form using this thread as maculature or a waste paper, the problem which the fragment of a thread mixes in a raw material is also solved.

[0026] Various processings may be performed to the base film of a thread if needed. For example, it is carrying out coating of the corona discharge treatment for an improvement of a NURE characteristic, priming, and the transparency resin, and performing hologram embossing processing etc. A thing with a thickness of 8-25 micrometers is usually used for the base film of a thread.

[0027] When forming the micro alphabetic character and micro image which consist of a metal vacuum evaporation layer on a base film, the PASUTA processing method can use it preferably. The approach of dry , after the PASUTA process method itself be an approach learned well , for example , dissolve the vacuum plating of aluminium layer to which it be immersed and the film have be expose other than a printing part , rinse [print an alphabetic character and an image in the ink which have alkali resistance in the vacuum evaporation side of the polyester film which carried out vacuum deposition of the metal aluminum ,] a film subsequently subsequently to a sodium hydroxide water solution and remove an aluminum hydroxide be a typical example (see JP,63-216795,A etc. in detail) . By carrying out like this, a printing part and the lower layer metal vacuum evaporation part which aligned with the printing part remain as it is on a film, and a film is exposed in the other part.

[0028] Thus, the thread used for this invention is obtained by usually carrying out the slit of the base film original fabric of the thread which performed various processings to the front face or the rear face, or formed the micro alphabetic character and/or the micro image to narrow-width [of 0.3-several mm] using the MACROSS liter.

[0029] In case a forged prevention form is manufactured by ***** in paper, when a thread exposes the thread in which the micro alphabetic character and the micro image were formed, in the aperture aperture section of a form (drawing 7), the micro alphabetic character and micro image on the front face of a thread can be checked by looking under the reflected light. Even when a thread is buried in paper and is not exposed to a form front face (drawing 6), under the transmitted light, the micro alphabetic character and micro image on a thread can be checked by looking.

[0030] In considering as the paper containing an aperture aperture thread using a thread, if the thread outcrop in the aperture aperture section is rubbed by a pawl etc., in case a thread will separate or it will print in a form, it is easy to produce the phenomenon in which a thread comes floating. Therefore, in case paper making of the paper containing an aperture aperture thread is carried out using the thread which carried out coating of the sensible-heat adhesives to table flesh-side both sides and this form is dried in the desiccation zone of a paper machine, the cellulose fiber and the thread which constitute a form for the sensible-heat adhesives by which coating is carried out to the thread melting or by softening can be pasted up certainly, and peel strength can also be raised.

[0031] In addition, when coating of the sensible-heat adhesives is carried out to front flesh-side both sides of a thread, the thread side exposed in the aperture aperture section of a form will contact a cylinder dryer, canvas, a touch roll, etc. inevitably at a paper machine in the middle of a desiccation zone, with heat, it softens and sensible-heat adhesives cause melting or the problem which pollutes front faces, such as a cylinder roll. Therefore, it is desirable not to carry out coating of the sensible-heat adhesives to the thread side (thread front face) exposed in the aperture aperture section of a form, but to carry out coating of the sensible-heat adhesives only to the thread side (thread rear face) which is not exposed in the aperture aperture section.

[0032] According to this invention, as shown in drawing 2 , a semiconductor chip 10 is pasted up on the front face or rear face of a thread 1 with adhesives. as adhesives -- water-soluble adhesives, such as PVA, starch, and sodium alginate, polychloroprene system adhesives, polyurethane adhesive, thermoplastic SBR system adhesives, hot melt system adhesives, epoxy system adhesives, vinyl system adhesives, phenoxy resin system adhesives, polyester system adhesives, polysulfone system adhesives, etc. -- independence -- or it can be combined and used. It is an example with desirable for example, adhesives excellent in especially a water resisting property and thermal resistance, and the typical epoxy adhesive of 2 liquid hardening mold. Moreover, the adhesives of an ultraviolet curing mold can be used to harden adhesives momentarily. In order to make it hard to separate the pasted-up semiconductor chip 10 from a thread 1, it is desirable to paste up the semiconductor chip 10 smaller than the width of a thread 1, for example, it is desirable to use the thread before and behind width of face of 1.0mm for the semiconductor chip of 0.3mm angle.

[0033] The completely same approach as the conventional "paper containing a thread" or "the paper containing an aperture aperture thread" can be used for the method of manufacturing a forged prevention form for the

thread which pasted up the semiconductor chip by ***** in paper.

[0034] it is ***** so that a thread may be buried in paper -- as an approach of manufacturing the paper containing a thread (drawing 6), any approach of the approach of one-layer ***** or the approach of multilayer ***** is employable. As the approach of one-layer ***** , it lets out a thread with the pulp supplied to a paper-making network, for example from the slice of a Fortlinear paper machine, and the insertion equipment of a thread is installed to the approach (JP,51-13039,A) of inserting so that a thread may be made buried in the interior of the paper formed in a paper-making screen oversize, and the pulp which flows out of the flow box of a Fortlinear paper machine, and the ***** approach (JP,2-169790,A) is mentioned in a thread, making a thread and pulp into a non-contact condition by airstream. It faces manufacturing ***** of the paper of an outermost layer of drum, and the paper of a inner layer which consists of two-layer at least, for example, using a multi-tub type cylinder machine as the approach of multilayer ***** , just before piling up each paper, a thread is inserted between paper, and the ***** approach can be adopted.

[0035] When inserting the thread which pasted up the semiconductor chip by ***** so that it may be buried in the paper of multilayer ***** , it is effective to form a slot to make thin only the paper of the part in which a thread is inserted, and insert a thread (refer to drawing 4 mentioned later (a)). By doing in this way, when a pressure joins a form, the thick part of paper serves as a cushion and it becomes possible to protect from the pressure which mentioned above the semiconductor chip on the thread inserted in the slot (thin part). Although the difference of the thickness of the thick part of paper and a thin part can be changed timely with the thickness of a semiconductor chip, or the thickness of construction material and a sheet, 0.5 to its twice of the thickness of a semiconductor chip are desirable about.

[0036] The technique of a well-known water mark can be used for the approach of forming the above-mentioned slot in paper. For example, the approach which solders a wire, a metal, resin, paper, etc. to the upper network of a cylinder-mo-ld cylinder, or has stuck on it enough with adhesives, and is used as it, In the state of the approach of applying a coating and resin to a network and plugging up a mesh, the method of giving direct irregularity to the paper-making network itself, the method of attaching a mold in a network using a photopolymer, and a wet paper web The approach of scraping a part forming a slot in with a scratch roll in the state of the approach and wet paper web which blow the compressed air upon a part to form a slot in etc. is mentioned.

[0037] moreover, as an approach of manufacturing the paper containing an aperture aperture thread (drawing 7) The belt device in which it has the slot which let the thread pass is buried at the head of heights of the guide which has irregularity in the pulp suspension on a paper-making network wire. How (JP,5-085680,B) to manufacture the paper containing an aperture aperture thread, A compressed-air nozzle is made to build in in the rotating drum on a Fortlinear-paper-machine wire. The approach of blowing away intermittently the slurry on the thread beforehand inserted in the wet paper web by the compressed air, and exposing a thread (JP,06-272200,A), The network processed in the shape of irregularity is used for the upper network of a cylinder machine, and it inserts, contacting a thread in the concavo-convex section on the front face of a network, and the ***** approach (U.S. Pat. No. 4462866) etc. is mentioned to an aperture aperture part in a thread.

[0038] In case the ***** doubling paper of the paper of an outermost layer of drum and the paper of a inner layer which consists of two-layer at least is furthermore manufactured using a multi-tub type cylinder machine The aperture aperture section is intermittently formed in the paper (or paper of a inner layer) of an outermost layer of drum, just before piling this up with the paper (or paper of an outermost layer of drum) of a inner layer without the aperture aperture section, a thread is inserted between paper, and the approach it is made for a thread to expose from the aperture aperture section can also be adopted.

[0039] Drawing 3 shows 2 tub type cylinder machine for manufacturing ***** containing an aperture aperture thread which consists of two-layer paper, and is equipped with the 1st tub 11 for forming the paper of a inner layer without the aperture aperture section, and the 2nd tub 12 for forming the paper of an outermost layer of drum which has the aperture aperture section. The paper of an outermost layer of drum which has the aperture aperture section can be formed by equipping cylinder-mo-ld cylinder 11a of a tub 11 with the upper network which does not manipulate at all, and attaching intermittently in the circumferencial direction of the upper network of cylinder-mo-ld cylinder 12a of a tub 12 two or more molds 13 which have a dimension equivalent to the aperture aperture section. A blanket 14 transfers to the paper which carried out paper making by cylinder-mo-ld cylinder 11a, it is carried on cylinder-mo-ld cylinder 12a, and is piled up on the paper of the outermost layer of drum by which paper making was carried out by this cylinder-mo-ld cylinder 12a, and the form by which two paper was ***** (ed) is milled. Insertion of a thread is performed in the part of the arrow

head V just before two paper piles up. While a thread 1 is exposed in the aperture aperture section 2 as shown in the mold 13 for aperture aperture section formation at drawing 7 by preparing the deficit part for forming the water mark of an alphabetic character or an image at this time, the paper containing an aperture aperture thread in which the water mark 3 was formed in the aperture aperture section 2 can be manufactured (refer to the patent No. 2845197 official report).

[0040] If the insertion point of a semiconductor chip is adjusted so that a semiconductor chip may be arranged at these apertures aperture section, since the aperture aperture section is thinner than the paper of other parts, the effectiveness of preventing destruction of a semiconductor chip will be acquired. Adjustment of the insertion point of a semiconductor chip is possible by adjusting the tension of a thread so that a detector may detect the location of the aperture aperture section and it may double with this location.

[0041] When arranging a semiconductor chip in the aperture aperture section and the semiconductor chip is arranged at the front-face side of the thread exposed in the aperture aperture section, there is risk of a semiconductor chip becoming unreserved, and separating and falling in the aperture aperture section. For this reason, it is desirable that the semiconductor chip has pasted the rear-face side of the thread side exposed in the aperture aperture section so that a semiconductor chip may not separate.

[0042] it is ***** about the thread which pasted up the semiconductor chip -- when considering as a bill, a gift certificate, a check, etc. using a forged prevention form, as shown in drawing 6 and drawing 7 , it is judged and used so that a thread may be located along with shorter sides, such as these bills and a gift certificate, or one side, but it is necessary to judge as at least one semiconductor chip is placed on the thread into one sheet, such as a bill and a gift certificate Moreover, the semiconductor chip may be located in the thread part which the semiconductor chip could be located on the thread exposed to the aperture aperture section, or was buried between the aperture aperture section and the aperture aperture section in the paper containing an aperture aperture thread.

[0043] ** -- in order to face manufacturing the paper [like] containing a thread and to raise productivity, usually inserting two or more threads of a book to the cross direction (namely, direction which becomes right-angled with the flow direction of the paper at the time of paper making) of paper is performed. Under the present circumstances, in order to prevent meandering by Kaminaka, where tension is usually applied by the thread, it is ***** rare ** to Kaminaka. such an approach -- a thread -- the cross direction of paper -- receiving -- an orientation -- ***** -- things become possible. Although the location precision of the cross direction of paper changes with the approaches and devices which detect a thread, it is desirable that it is less than **2mm preferably less than **5mm.

[0044] the condition of having applied tension to the thread as mentioned above -- Kaminaka -- ***** , by things, a thread can be arranged with a precision sufficient in an orientation to the cross direction of paper, this is used, and a semiconductor chip is located in an orientation to the cross direction of paper -- as -- ***** -- things are made. However, the location of a semiconductor chip is uncontrollable by this approach to the flow direction of the paper at the time of paper making. Since this is made possible, the elastic deformation of a thread mentioned later can be used.

[0045] Generally, there is a property [like the rubber which will be shrunken if the property which carries out elastic deformation, i.e., tension, is applied in the case of low tension and elongation and tension will become weaker] whose plastic film used as the base film of a thread is. It is possible to adjust the location of the semiconductor chip in the flow direction of the paper at the time of paper making using the property in which a thread carries out elastic deformation. This principle is as follows. In a thread, in the paper under paper making, in the ***** case, if tension is applied to a thread, elastic deformation of the thread will be carried out and it will be extended. If it does so, spacing of the semiconductor chip pasted up on the thread and a semiconductor chip will become long, and will become possible [shifting the location of semiconductor chips]. Conversely, if tension is weakened, the location of the same principle to a semiconductor chip and a semiconductor chip will become narrow.

[0046] When the concrete example was raised and explained, it is going to arrange the semiconductor chip in the orientation of the flow direction of the paper under paper making and the semiconductor chip has shifted to the downstream of the flow direction of paper from the target location, a semiconductor chip can be shifted to the upstream of the flow direction of paper by strengthening the tension of a thread. Tension will be returned if a thread is installed in the target location. When a semiconductor chip shifts to the upstream of the flow direction of paper, the tension of a thread is weakened conversely. In addition, when the tension applied to a thread is too strong, a thread is extended too much, and since it does not return to the die length of a basis even if it

weakens tension, it needs to be careful.

[0047] At the process which pastes up a semi-conductor thread on a thread, although it is required to paste up a semiconductor chip on a thread at fixed spacing, even when the semiconductor chip has pasted up at fixed spacing, spacing of the semiconductor chip on a thread may shift delicately during paper making. Even if each is small, a gap will accumulate this gap between the paper-making processes of long duration, and it will shift greatly eventually. Then, in order to adjust the location of the semiconductor chip of the flow direction of paper so that it may always become fixed, the location of the semiconductor chip on a thread, the insertion die length into the paper per unit time amount of a thread, and a form need to get to know the die length per ***** time amount (paper-making rate) to accuracy.

[0048] For this reason, the timing mark used as the rule of thumb of alignment is given to a thread and a form. When giving a timing mark to a thread, a thread can be colored at fixed spacing, or as shown in drawing 2, in the case of the thread of the polyester film which vapor-deposited aluminum, the approach of forming the vacuum-plating-of-aluminium elution section 21 as a timing mark using the PASUTA processing method to the die-length direction of a thread at fixed spacing can be adopted.

[0049] When a thread is colored at fixed spacing, the part colored with the detector can be detected easily. Although these coloring can use the color and pigment which reflects the light by the light, since the colored part can check these coloring visually, it is not usually desirable. For this reason, it is desirable to color using the color and pigment which reflects the light of wavelength other than the light. A fluorescence developed color and a pigment, and an infrared developed color and a pigment can be used for these colors and a pigment. Visually by using such a color and a pigment, it becomes possible to give the timing mark which cannot be checked to a thread.

[0050] Moreover, as shown in drawing 2, when the vacuum-plating-of-aluminium section 20 is formed in a thread 1, the vacuum-plating-of-aluminium elution section 21 can detect the location with the photoelectric tube using a beam of light passing. Moreover, the approach of detecting semiconductor chip 10 the very thing pasted up on the thread 1 is also applicable. Since the semiconductor chip used for this invention can exchange data by the electric wave, the electrostatic coupling, an electromagnetic wave, etc. by the non-contact method, it can detect the location of a semiconductor chip easily using these principles. If the semiconductor chip 10 has pasted accuracy at fixed spacing on the thread 1, the insertion die length per unit time amount of a thread is also computable by detecting the location of this semiconductor chip itself.

[0051] In giving a timing mark to a form, the mold for timing-mark production is stuck on the upper network of the cylinder-mold cylinders 11a and 12a which were illustrated to drawing 3, and it mills a form. The form to which the paper of the part became thin by the principle of a "watermarked paper" can be milled by carrying out like this. The part which became thin can detect the location with the photoelectric tube. Moreover, the approach of coloring a form at fixed spacing is also applicable. The colored location is easily detectable if an optical detector is used. In order to color a timing mark a form, the same color and pigment as the case where a timing mark is colored a thread can be used.

[0052] A location is also detectable by sticking a luminosity plate on the edge of the cylinder-mold cylinders 11a and 12a which were illustrated to drawing 3, irradiating a spotlight in this location, and on the other hand, reading that reflected light with the photoelectric tube besides giving a timing mark to the form itself. This approach is advantageous from not giving a timing mark to a form. Also when manufacturing by long network paper making, on a paper-making wire, a luminosity plate can be detected at fixed spacing and a location can be detected by anchoring and the same principle. A luminosity plate is one example, may form a coloring part in a paper-making wire instead of a luminosity plate, and may give the mark by a blemish etc. to extent which is not in paper making a problem at a paper-making wire. Moreover, the same effectiveness is acquired even if the mark which detects the location of such a form gives a WET press, a dryer cylinder, etc. to the revolution object in a paper-making process besides a cylinder-mold cylinder and a wire.

[0053] Thus, a form can detect the die length per ***** time amount as the insertion die length per unit time amount of a ***** rare ** thread separately on paper. Moreover, the location of a semiconductor chip can be checked by the approach mentioned above. In order to insert a semiconductor chip in the location which the form aimed at, thread insertion equipment is adjusted, alignment of a thread is first performed in the cross direction of a form, the tension subsequently to a thread applied in the flow direction of a form is adjusted, and alignment of the semi-conductor on the thread in a form flow direction is performed. The alignment of the flow direction of a form becomes possible [carrying out automatically] by interlocking the timing mark of a form and a thread and the detection equipment of the location of the semiconductor chip on a thread, and the tension

adjusting device of a thread.

[0054] Although the sheet-like object for forged prevention and its manufacture approach of this invention were explained taking the case of the forged prevention form above, the sheet-like object by this invention can also consist of a plastic film, a plastic sheet, a ceramic sheet, textiles, a thermoplastics sheet, a thermosetting resin sheet, etc. besides paper.

[0055] What pasted together the thread which pasted up the semiconductor chip on the front face of the sheet-like object with which one gestalt of the sheet-like object for forged prevention of this invention is chosen from paper, a plastic film, a plastic sheet, a ceramic sheet, textiles, a thermoplastics sheet, a thermosetting resin sheet, etc. is mentioned. Since the part pasted up by the thickness of the thickness of a thread, the thickness of a semiconductor chip, and adhesives on the occasion of pasting rises, in order to cancel this fault, as shown in drawing 4 (a), it is good to form in the sheet-like object 30 beforehand the slot 31 which made thickness thin. The approach of making it corrode with the approach of attaching a mold by an approach, embossing, etc. which make thickness thin at a paper-making process as an approach of forming a slot 31 in the sheet-like object 30 with a well-known water mark technique which was mentioned above, for example, and making thickness thin, a chemical, etc., the approach of making thickness thin by etching, etc. are employable.

[0056] In order to arrange a semiconductor chip in the predetermined location of a sheet-like object, in case a thread is pasted together on a sheet-like object front face, it is good to paste a thread together so that the location of the timing mark formed in the sheet-like object and the timing mark given to the thread may be detected, the tension of a thread may be adjusted and a semiconductor chip may be arranged in a predetermined location.

[0057] Drawing 4 (b) shows the condition of having pasted the thread 1 together into the slot 31 on drawing 4 (a). In this case, it is desirable to arrange the semiconductor chip 10 on the background of thread 1 exposed surface so that a semiconductor chip 10 may not be exposed to a sheet-like object 30 front-face side.

[0058] Another gestalt of the sheet-like object for forged prevention of this invention Paper, a plastic film, a plastic sheet, a ceramic sheet, In case textiles, a thermoplastics sheet, a thermosetting resin sheet, etc. are pasted together combining the sheet of the sheets of the same construction material, or construction material of a different kind What pasted together on this the sheet-like object on which a thread is pasted up on the thing pasted together while inserting among both the thread on which the semiconductor chip was pasted up, or the sheet-like object which is one side beforehand, and the thread is not pasted up is mentioned. Since the part pasted together by the thickness of a thread on the occasion of pasting rises, in order to cancel this fault, it is good to form the slot which made thickness thin in the sheet-like object which is one side beforehand, as shown in drawing 4 , and to insert a thread in this slot.

[0059] What is necessary is to detect the location of the timing mark formed in the sheet-like object, and the timing mark given to the thread, and just to insert a thread so that the tension of a thread may be adjusted and a semiconductor chip may be arranged in a predetermined location in case the sheet-like object of two or more sheets is pasted together, in order to arrange a semiconductor chip to a position.

[0060] If a sheet-like object with cushioning properties is used when inserting the thread which pasted the sheet-like object of two or more sheets together, and the semiconductor chip pasted up among these, it can soften that the thickness of a thread or a semiconductor chip rises. For example, in the case of the structure which sticks a plastic film and the nonwoven fabric of a low consistency, and the pasting sheet of a configuration of sticking on both sides of the nonwoven fabric of a low consistency with a plastic sheet, by inserting a thread among these sheet-like objects, the nonwoven fabric of a low consistency serves as a cushion, and climax by the thickness of a thread or a semiconductor chip can be eased.

[0061] As an approach of inserting in the interior of a plastic film or a plastic sheet the thread which the semiconductor chip pasted up How to insert the thread which let out two or more plastic films and plastic sheets, and the semiconductor chip pasted up between them, and carry out melting adhesion with heat, In manufacturing a plastic film with a melting extrusion process using an extruder How to make breathe out simultaneously the resin which serves as the thread and the ingredient of a plastic film which the semiconductor chip pasted up from an extruder delivery and by which thermofusion was carried out, and carry out cooling solidification, Two extruder deliveries are prepared, and in case the resin by which thermofusion was carried out from each delivery is breathed out and pasted together, the approach of inserting among both the thread which the semiconductor chip pasted up etc. can be adopted.

[0062]

[Example] An example is given to below and this invention is more concretely explained to it.

[Example 1]

All over the front face of polyester film with a <production of thread> width of face [of 1250mm], and a thickness of 16 micrometers, metal aluminum was vapor-deposited so that it might become 400A in thickness. Coating of the alkali-proof acrylic resin ink was carried out using the gravure roll so that an alkali-proof acrylic resin ink coating layer with a width of face of 82.6mm might vacate spacing with a width of face of every 3mm and might be repeatedly formed in parallel on the vacuum-plating-of-aluminium side of this polyester film. Subsequently, this film was immersed into the 5-% of the weight sodium-hydroxide water solution, and the vacuum-plating-of-aluminium side exposure part of width-of-face 3mm which has not carried out coating of the alkali-proof acrylic resin ink was made eluted. The polyester film with which the vacuum-plating-of-aluminium section 20 with a width of face of 82.6mm which was illustrated to drawing 5 was formed every width of face of 3mm by this was obtained. The number 21 in drawing shows the vacuum-plating-of-aluminium elution section. It is the coating which contains polyester system sensible-heat adhesives (a trade name "Byron", Toyobo Co., Ltd. manufacture) at the rear face (field where a vacuum-plating-of-aluminium side is not given) of this film 5 g/m² Coating (desiccation conversion) was carried out and the sensible-heat adhesives coating layer was formed. As the polyester film obtained in this way was illustrated to drawing 5 using the micro slitting machine, the slit was carried out to a width of 1.5mm, and the thread was manufactured.

[0063] As a <adhesion of semiconductor chip to thread> semiconductor chip, one side which was illustrated to drawing 1 used 0.3mm and the semiconductor chip 10 with a thickness of about 30 micrometers. As shown in drawing 2, the adhesives of an ultraviolet curing mold were used in the center of the vacuum-plating-of-aluminium section 20 of the front face (field which has not carried out coating of the sensible-heat adhesives) of a thread, and every one of this semiconductor chip 10 was pasted up one after another. The vacuum-plating-of-aluminium elution section 21 in drawing 2 functions as a timing mark used as the rule of thumb of the adhesion location of a semiconductor chip.

[0064] Beating of the manufacture > needle-leaved-tree-bleached-kraft-pulp (NBKP) 20 weight section of a forged prevention form (paper containing an aperture aperture thread) and the broad-leaved-tree-bleached-kraft-pulp (LBKP) 80 weight section is carried out to freeness 350mlC.S.F. it is ***** about < thread — Optimum dose **** pulp was prepared for the clay 10 weight section, the paper reinforcing agent (product made from trade name "police TRON 191" Arakawa Chemical industry) 0.3 weight section, the sizing compound (product made from trade name "size Pineapple E" Arakawa Chemical industry) 1.0 weight section, and a sulfuric-acid band to this. Two-layer ***** was manufactured by part for 50m/in paper-making rate with 2 tub type cylinder machine shown in drawing 3 using this pulp. Under the present circumstances, the thread manufactured above was inserted between the 1st layer (it is basis weight 50 g/m² by dry weight conversion), and the 2nd layer (these 50 g/m²).

[0065] It read with the informational writing to < semiconductor chip, and the writing of the information on > semiconductor chip was performed by forming a pattern in a wafer by electron ray direct writing in the phase of a wafer production process. Moreover, it faced reading this information, the conveyance carrier by microwave (2.45GHz) was given to the antenna of a semiconductor chip according to non-contact, the circuit inside a semiconductor chip was started, and information was read. Thus, truth or falsehood can be promptly judged by collating the read information and the Shinsei memory information which should be written in beforehand.

[0066]

[Effect of the Invention] A detailed semiconductor chip can be alone pasted together on the front face of a sheet-like object by according to this invention, pasting together the thread which pasted up the semiconductor chip on a sheet-like object front face, or inserting in the interior of a sheet-like object, or workability can be substantially improved compared with inserting in the interior of a sheet-like object so that it may understand from the place mentioned above, and the sheet-like object for forged prevention can be obtained very efficiently and simple.

[0067] Furthermore, the timing mark used as the rule of thumb of the adhesion location of a semiconductor chip is given to the thread. In case this thread is pasted together or inserted in a sheet-like object, the location of the timing mark given to the timing mark and sheet-like object which were given to the thread is made into a rule of thumb. By pasting together or inserting a thread in a sheet-like object, it becomes possible about a semiconductor chip accuracy and to paste together or insert efficiently in the predetermined location of a sheet-like object, detecting these timing marks.

[0068] according to the sheet-like object for forged prevention of this invention obtained in this way — only — a thread — ***** — the forged prevention means by things — in addition, truth can be promptly judged by

collating the information read in the semiconductor chip, and memory information, and a much more advanced and positive forged prevention means can be given.

[Translation done.]